**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**
**BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES**

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| In re Application of: Charles N. Harper | § | Group Art Unit: 3692 |
| Serial No.: 09/916,548 | § | |
| Confirmation No.: 8550 | § | Examiner: Ojo O. Oyebisi |
| Filed: July 27, 2001 | § | |
| For: DECISION SUPPORT SYSTEM AND METHOD | § | |

MAIL STOP APPEAL BRIEF - PATENTS
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

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| December 31, 2007 | /Jon K. Stewart/ |
| Date | Jon K. Stewart |

## APPEAL BRIEF

Dear Sir:

Applicants submit this Appeal Brief to the Board of Patent Appeals and Interferences on appeal from the decision of the Examiner of Group Art Unit 3692 dated May 31, 2007, finally rejecting claims 21-42. The final rejection of claims 21-42 is appealed. This Appeal Brief is believed to be timely since it is electronically transmitted by the due date of December 31, 2007, as set by the filing of a Notice of Appeal on October 31, 2007. Please charge the fee of $510.00 for filing this brief to Deposit Account No. 20-0782/1619.026169 (AIR/0039)/GGM.

# TABLE OF CONTENTS

## Real Party in Interest

The present application has been assigned to L'Air Liquide, Société Anonyme à Directoire et Conseil de Surveillance pour l'Etude et l'Exploitation des Procédés Georges Claude, Paris, France.

## Related Appeals and Interferences

Applicant asserts that no other appeals or interferences are known to the Applicant, the Applicant's legal representative, or assignee which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

## Status of Claims

Claims 21-42 are pending in the application. Claims 1-20 were originally presented in the application. Claims 21-42 were added during prosecution. Claims 1-20 have been canceled without prejudice. Claims 21-42 stand finally rejected as discussed below. The final rejections of claims 21-42 are appealed. The pending claims are shown in the attached Claims Appendix.

## Status of Amendments

All claim amendments have been entered by the Examiner. No amendments to the claims were proposed after the final rejection.

## Summary of Claimed Subject Matter

Claimed embodiments include methods (*see* claims 21-27, 40) computer programs stored on computer readable storage media (*see* claims 28-34, 41) and computer systems (*see claims* 35-39, 42) directed to indentifying an excess energy capacity in a production supply chain operated by a supply chain operator. Stated differently, claimed embodiments are directed to a decision support system suitable for supporting decisions related to electricity production by power generation facilities that also sustain industrial production. *See Application*, 1:3-6.

### A. CLAIM 21 – INDEPENDENT

Claim 21 recites a method for identifying an excess energy capacity in a production supply chain operated by a supply chain operator. *See Application*, 1:3-6, *Abstract*. As claimed, this method includes identifying, by a supply chain optimizer, a potential production configuration for the production supply chain. See *Application*, 3:16-19, 5:2-5, 12:18-23, Figure 1, 34. As claimed, the supply chain operator also operates at least one power generation facility to sustain industrial production by the production supply chain. See *Application* 13:1-3, Figure 1, 14. And the supply chain operator is capable of both consuming and selling electricity produced by the power generation facility while operating the production supply chain. See *Application*, 5:6-7, 6:20-23, 7:1-2, 14:9-11, Figure 1, 14, 16, 19, 20, 22, 24. Also as claimed, the potential production configuration is related to a target electricity production by the power generation facility. See *Application*, 13:1-15. And the potential production configuration reduces a production output and energy consumption for at least some portion of the production supply chain or increases electricity production by the power generation facility during a given time period. See *Application*, 3:12-13, 3:20-23, 4:1-4, 13:4-15, Fig 1, 36, 38. As claimed, the method also includes determining, using a potential action valuation model, whether to reduce the production output of the production supply chain or increase electricity production by the power generation facility according to the potential production configuration to create the excess energy capacity during the time period. See *Application*, 3:12-13, 3:20-23, 4:1-4, 13:4-15, Fig 1, 36, 38. And also

includes, if production output is determined to be reduced or electricity production by the power generation facility is determined to be increased, selling the excess energy capacity created by implementing the potential production configuration during the time period for the production supply chain and the power generation facility. See *Application*, 4:12-15, 13:14-15, 14:1-14.

B. CLAIM 40 – DEPENDENT

Claim 40 further limits claim 21. Specifically, claim 40 specifies that the production supply chain comprises one of an air component separation facility, an oil field electric pump network, a refinery, and a metal ore production facility. See Application 1:1-17. Figure 1, 12, 22, and 24.

C. CLAIM 28 - INDEPENDENT

Claim 28 is directed to a computer-readable storage medium containing a program which, when executed, performs operations for identifying an excess energy capacity in a production supply chain operated by a supply chain operator. *See Application*, 1:3-6, *Abstract*. As claimed, the operation includes identifying, by a supply chain optimizer, a potential production configuration for the production supply chain for a supply chain. See *Application*, 3:16-19, 5:2-5, 12:18-23, Figure 1, 34. As claimed, the supply chain operator also operates at least one power generation facility to sustain industrial production by the production supply chain. See *Application* 13:1-3, Figure 1, 14. And the supply chain operator is capable of both consuming and selling electricity produced by the power generation facility while operating the production supply chain. See *Application*, 5:6-7, 6:20-23, 7:1-2, 14:9-11, Figure 1, 14, 16, 19, 20, 22, 24. Also as claimed, the potential production configuration is related to a target electricity production by the power generation facility. See *Application*, 13:1-15. And the potential production configuration reduces a production output and energy consumption for at least some portion of the production supply chain or increases electricity production by the power generation facility during a given time period. See *Application*, 3:12-13, 3:20-23, 4:1-4, 13:4-15, Fig 1, 36, 38. The operation also includes determining, using a potential action valuation model, whether to reduce the production output of the production supply chain

or increase electricity production by the power generation facility according to the potential production configuration to create the excess energy capacity for the production supply chain during the time period. See *Application*, 3:12-13, 3:20-23, 4:1-4, 13:4-15, Fig 1, 36, 38. And also includes, if production output is determined to be reduced or electricity production by the power generation facility is determined to be increased, selling the excess energy capacity created by implementing the potential production configuration during the time period for the production supply chain and the power generation facility. See *Application*, 4:12-15, 13:14-15, 14:1-14.

D. CLAIM 41 – DEPENDENT

Claim 41 further limits claim 28. Specifically, claim 41 specifies that the production supply chain comprises one of an air component separation facility, an oil field electric pump network, a refinery, and a metal ore production facility. See Application 1:1-17. Figure 1, 12, 22, and 24.

E. CLAIM 35 – INDEPENDENT

Claim 35 is directed to a computing device. As claimed the computing device includes at least one processor and a memory, wherein the memory includes a plurality of models, which when executed by the processor, are configured to identify an excess energy capacity in a production supply chain operated by a supply chain operator, including. *See Application*, 1:3-6, *Abstract*. 3:9-19, 7:13-17. Figure 1, 28, 30, 32, 34, 36, and 38. As claimed, the computing device includes a supply chain optimizer configured to identify a potential production configuration for the production supply chain.

As claimed, the supply chain operator also operates at least one power generation facility to sustain industrial production by the production supply chain. See *Application* 13:1-3, Figure 1, 14. And the supply chain operator is capable of both consuming and selling electricity produced by the power generation facility while operating the production supply chain. See *Application*, 5:6-7, 6:20-23, 7:1-2, 14:9-11, Figure 1, 14, 16, 19, 20, 22, 24. Also as claimed, the potential production configuration is related to a target electricity production by the power generation facility. See

*Application*, 13:1-15. And the potential production configuration reduces a production output and energy consumption for at least some portion of the production supply chain or increases electricity production by the power generation facility during a given time period. See *Application*, 3:12-13, 3:20-23, 4:1-4, 13:4-15, Fig 1, 36, 38. As claimed, the computing device includes a potential action valuation model configured to determine whether to reduce the production output of the production supply chain or increase electricity production by the power generation facility according to the potential production configuration to create the excess energy capacity for the production supply chain during the time period. See *Application*, 3:12-13, 3:20-23, 4:1-4, 13:4-15, Fig 1, 36, 38. The computing device also includes a data delivery engine configured to supply real-time data to the potential action valuation model and to the supply chain optimizer. See *Application*, 7:18-23, 8:1-23, 9:1-13, and Figure 2, 52.

F CLAIM 42 – DEPENDENT

Claim 42 further limits claim 28. Specifically, claim 42 specifies that the production supply chain comprises one of an air component separation facility, an oil field electric pump network, a refinery, and a metal ore production facility. See Application 1:1-17. Figure 1, 12, 22, and 24.

## Grounds of Rejection to be Reviewed on Appeal

1. Rejection of claims 21-42 under 35 U.S.C. § 102(b) as being anticipated by *Takriti*, U.S. Pat. No. 6,021,402 (hereinafter *Takriti*).

## ARGUMENTS

### 1. *Takriti* does not anticipate claims 21-42

*The Applicable Law*

"A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). "The identical invention must be shown in as complete detail as is contained in the ... claim." *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989). The elements must be arranged as required by the claim. *In re Bond*, 910 F.2d 831, 15 USPQ2d 1566 (Fed. Cir. 1990).

In this case, *Takriti* does not disclose "each and every element as set forth in the claim." For example, *Takriti* does not disclose the method recited by claim 21 for "identifying an excess energy capacity in a production supply chain operated by a supply chain operator" that includes "identifying, by a supply chain optimizer, a potential production configuration for the production supply chain," where the supply chain operator both:

- "operates at least one power generation facility <u>to sustain industrial production by the production supply chain</u>", and
- "is capable of <u>both consuming and selling electricity</u> produced by the power generation facility <u>while operating the production supply chain</u>."

Claims 28 and 35 recite similar limitations. The Examiner suggests that *Takriti* discloses a method that includes these limitations. Specifically, regarding claims 21, 28, 35 and 40-42, the Examiner argues:

> *Takriti* discloses a computer-implemented method for identifying an excess energy capacity in a production supply chain operated by a supply chain operator, comprising: identifying, by a supply chain optimizer, a potential production configuration for the production supply chain (*i.e., a mathematical model of the problem is solved using appropriate optimization techniques. The solution provides the status of each generator at each time period of the planning horizon under each given scenario. By "status of a generator", what is meant is whether it is*

> *on or off. The solution also provides the load on each generator during each period in which it is operating,' an optimal fuel mix for each generating unit, and the prices for purchasing and selling power in the periods of the planning horizon. The technique used to solve the model provides information regarding the sensitivity of the solution to the input parameters and other valuable information to the decision maker.*)

*See Final Office Action*, p 2-3. The italicized portion quotes *Takriti*, 5:7-18. First, nothing in the cited passage discloses anything to do with a production supply chain operated by a supply chain operator. Instead, the cited passage describes "a mathematical model" used to determine whether to turn on (or off) a power generator at different periods of time. The "mathematical model" helps an electrical utility decide what generators to turn on (or off) and what fuel mixtures to use in a given. In other words, how an electrical utility may to produce electricity at the lowest cost. At the same time, however, this limited focus on the problems faced by an electrical utility fails to disclose a supply chain operator that operates at least one power generation facility <u>to sustain industrial production</u> by the production supply chain operator.

Viewed in context, it is clear that *Takriti* is directed to the operations of an electric utility in determining when, and how much, electricity to generate. For example, set out more fully, the passage cited by the Examiner provides:

> <u>The invention provides a computer implemented process for scheduling the generating units of a utility while taking into consideration power trading with other utilities and the stochastic load on the system</u>. The system allows the user to provide multiple load forecasts and to vary the fuel price between the different scenarios and the different periods of the planning horizon. The tool allows the user to model accurately the uncertain trading transactions and the changing fuel prices. Given (1) a planning horizon, (2) a set of electric-load forecasts and fuel prices, (3) a full description of the properties of the electric-power generators, (4) reserve requirements for the system, (5) an estimate of the price of electricity in the open market at each hour of the week, and (6) a set of possible trading transactions for the next two to seven days, the goal is to meet the electric demand of customers at a minimal cost while making the maximum profit possible from power trading. To do so, a mathematical model a mathematical model of the problem is solved using appropriate optimization techniques. ...

*Takriti*, 4:57-67 – 5:1-17. Moreover, the passage cited by the Examiner from *Takriti* is squarely directed to the optimizing the operations of an electrical utility, and not to

optimizing the operations of a production supply chain for a supply chain operator "capable of both consuming and selling electricity produced by the power generation facility while operating the production supply chain," as recited by claim 1. Regarding this limitation, the Examiner suggests:

> [*Takriti* discloses] the supply chain operator also operates at least one power generation facility to sustain industrial production by the production supply chain (see fig. 2 element 12), (ii) the supply chain operator is capable of both consuming and selling electricity produced by the power generation facility while operating the production supply chain (i.e., marginal prices and sensitivity analysis for buying and selling, fig. 2).

*Office Action*, p.3. However, *Takriti* describes Figure 2, element 12, as follows: "The output of the tool 111 is the fuel consumption, fuel mix, and generation requirement to each of a plurality of generating plants $12_1$ to $122_n$ which are connected to transmission lines 13 for delivery of electrical power to customers $14_1$ to $14_m$ and to other utilities 15." *Takriti*, 6:11-15. In other words, Figure 2, element 12 merely refers to "a plurality of generating plants." No description of a production supply chain or a supply chain operator is described, or even implied.

Based on the discussion above, it is clear that *Takriti* is directed to a tool used to optimize the operations of an <u>electrical utility</u> and does not disclose a method for identifying an excess energy capacity in <u>a production supply chain operated by a supply chain operator</u> having the limitations recited by the present claims. Other passages from *Takriti* only serve to further highlight this distinction:

> It is therefore an object of the invention to provide a computer risk-management system for scheduling the generating units of an electric utility.
> It is another object of the invention to provide computer implemented process that manages generating units of an electric utility which handles multiple fuel, fuel constraints, varying fuel prices, power trading, and load uncertainty.

*Takriti*, 4:50-57.

> The present invention is a tool that can be used to schedule the generating units of an electric utility while taking power trading and fluctuation in fuel prices into consideration. This tool mixes traditional techniques used in scheduling generators of an electric utility with

> hedging strategies that are widely used in the finance industry. The result is a robust generating schedule.

*Takriti* 5:65-67 – 6:1-5.

> The present invention provides a utility with a tool that promotes a better understanding of the relationship between the electric-power and fuel markets allowing a utility to hedge against uncertainty in both markets.

*Takriti*, 7:46-54. The common thread through all these passages is the desirability for an <u>electrical utility</u> to optimize its operations. In contrast, the claims recite a method for an operator of an <u>industrial production facility</u> that also has some electrical generation capacity to optimize a production supply chain. For example,

> The process of deregulation of the utility industry has already occurred in several states and there presently exists an increased trend toward deregulation throughout the United States. This change in regulatory environment creates the potential for altering the value of industrial power generation facilities which have been utilized for production support in businesses that require large amounts of electrical power such as air component separation facilities, oil field electric pump networks, refineries, iron production facilities, and the like.

*Application*, ¶ 0004. For all the foregoing reasons, Applications submit that *Takriti* does not anticipate independent claims 21, 28, or 35, or dependent claims 22-27, 29-34, 36-39; and accordingly, request that the Board order the Examiner to withdraw the rejection of these claims.

Furthermore, regarding claims 40, 41, and 42, the Examiner does not even provide an argument that *Takriti* discloses the limitations of these claims. MPEP 707.07(d) provides that "[a] plurality of claims should never be grouped together in a common rejection, unless that rejection is equally applicable to all claims in the group." In this case, the claims recite substantially different limitations that are not amenable to a common rejection. For example, claim 40 further specifies that "the production supply chain comprises one of an air component separation facility, an oil field electric pump network, a refinery, and a metal ore production facility." Claims 41 and 42 include a similar limitation characterizing claims 28 and 35, respectively. Other than including these claims in the list of claims rejected over the *Takriti* reference, the Examiner does not provide any rationale for rejecting claims 40, 41, and 42. From the above discussion, however, it should be clear *Takriti* does not disclose a method for optimizing

the operations of a production supply chain in general, and in particular, where the "production supply chain" comprises "an air component separation facility, an oil field electric pump network, a refinery, and a metal ore production facility."

Accordingly, for all the foregoing reasons, Applicants request that the Board order the Examiner to withdraw the rejection of claims 40-42.

## CONCLUSION

The Examiner errs in finding that claims 21-42 are anticipated by *Takriti* under 35 U.S.C. § 102(b).

Withdrawal of the rejection and allowance of all claims is respectfully requested.

Respectfully submitted, and
**S-signed pursuant to 37 CFR 1.4,**

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## CLAIMS APPENDIX

**Claims 1 – 20 (cancelled)**

21. (Previously Presented) A computer-implemented method for identifying an excess energy capacity in a production supply chain operated by a supply chain operator, comprising:

identifying, by a supply chain optimizer, a potential production configuration for the production supply chain, wherein:

(i) the supply chain operator also operates at least one power generation facility to sustain industrial production by the production supply chain,

(ii) the supply chain operator is capable of both consuming and selling electricity produced by the power generation facility while operating the production supply chain,

(iii) the potential production configuration is related to a target electricity production by the power generation facility, and

(iv) the potential production configuration reduces a production output and energy consumption for at least some portion of the production supply chain or increases electricity production by the power generation facility during a given time period;

determining, using a potential action valuation model, whether to reduce the production output of the production supply chain or increase electricity production by the power generation facility according to the potential production configuration to create the excess energy capacity during the time period; and

if production output is determined to be reduced or electricity production by the power generation facility is determined to be increased, selling the excess energy capacity created by implementing the potential production configuration during the time period for the production supply chain and the power generation facility.

22. (Previously Presented) The method of claim 21, wherein the potential action valuation model determines whether to reduce the production output of the production supply chain using a risk management model.

23. (Previously Presented) The method of claim 22, wherein the risk management model may be configured according to a set of risk tolerance criteria and risk performance criteria.

24. (Previously Presented) The method of claim 21, wherein the forecasted price for electricity during the time period is determined using a forecasting and planning model utilizing historical and real-time data.

25. (Previously Presented) The method of claim 21, wherein, if production output is determined to be reduced, prior to the time period, increasing the production output of the supply chain to prepare of the reduced production of the supply chain for the time period.

26. (Previously Presented) The method of claim 21, wherein a data delivery engine is configured to supply real-time data to the potential action valuation model, the supply chain optimizer, the forecasting and planning model, and the risk management model.

27. (Previously Presented) The method of claim 26, wherein the real-time data includes real-time commodity prices for electricity.

28. (Previously Presented) A computer-readable storage medium containing a program which, when executed, performs operations for identifying an excess energy capacity in a production supply chain operated by a supply chain operator, the operation comprising:

identifying, by a supply chain optimizer, a potential production configuration for the production supply chain for a supply chain, wherein

(i) the supply chain operator also operates at least one power generation facility to sustain industrial production by the production supply chain,

(ii) the supply chain operator is capable of both consuming and selling electricity produced by the power generation facility while operating the production supply chain,

(iii) the potential production configuration is related to a target electricity production by the power generation facility, and

(iv) the potential production configuration reduces a production output and energy consumption for at least some portion of the production supply chain or increases electricity production by the power generation facility during a given time period where a contracted price for the electricity exceeds a forecasted price;

determining, using a potential action valuation model, whether to reduce the production output of the production supply chain or increase electricity production by the power generation facility according to the potential production configuration to create the excess energy capacity for the production supply chain during the time period; and

if production output is determined to be reduced or electricity production by the power generation facility is determined to be increased, selling the excess energy capacity created by implementing the potential production configuration during the time period for the production supply chain and the power generation facility.

29. (Previously Presented) The computer-readable medium of claim 28, wherein the potential action valuation model determines whether to reduce the production output of the production supply chain using a risk management model.

30. (Previously Presented) The computer-readable medium of claim 29, wherein the risk management model may be configured according to a set of risk tolerance criteria and risk performance criteria.

31. (Previously Presented) The computer-readable medium of claim 28, wherein the forecasted price for electricity during the time period is determined using a forecasting and planning model utilizing historical and real-time data.

32. (Previously Presented) The computer-readable medium of claim 28, wherein, if production output is determined to be reduced, prior to the time period, the operations further include increasing the production output of the supply chain to prepare of the reduced production of the supply chain for the time period.

33. (Previously Presented) The computer-readable medium of claim 28, wherein a data delivery engine is configured to supply real-time data to the potential action valuation model, supply chain optimizer, forecasting and planning model, and the risk management model.

34. (Previously Presented) The computer-readable medium of claim 33, wherein the real-time data includes real-time commodity prices for electricity.

35. (Previously Presented) A computing device, comprising:

at least one processor; and

a memory, wherein the memory includes a plurality of models, which when executed by the processor, are configured to identify an excess energy capacity in a production supply chain operated by a supply chain operator, including:

a supply chain optimizer configured to identify a potential production configuration for the production supply chain, wherein:

(i) the supply chain operator also operates at least one power generation facility to sustain industrial production by the production supply chain,

(ii) the supply chain operator is capable of both consuming and selling electricity produced by the power generation facility while operating the production supply chain,

(iii) the potential production configuration is related to a target electricity production by the power generation facility, and

(iv) the potential production configuration reduces a production output and energy consumption for at least some portion of the production supply chain or increases electricity production by the power generation facility during a given time period where a contracted price for the electricity exceeds a forecasted price;

a potential action valuation model configured to determine whether to reduce the production output of the production supply chain or increase electricity production by the power generation facility according to the potential production configuration to create the excess energy capacity for the production supply chain during the time period; and

a data delivery engine configured to supply real-time data to the potential action valuation model and to the supply chain optimizer.

36. (Previously Presented) The computing device of claim 35, wherein the potential action valuation model determines whether to reduce the production output of the production supply chain using a risk management model.

37. (Previously Presented) The computing device of claim 36, wherein the risk management model may be configured according to a set of risk tolerance criteria and risk performance criteria.

38. (Previously Presented) The computing device of claim 35, wherein the forecasted price for electricity during the time period is determined using a forecasting and planning model utilizing historical and real-time data.

39. (Previously Presented) The computing device of claim 35, wherein the real-time data includes real-time commodity prices for electricity.

40. (Previously Presented) The method of claim 21, wherein the production supply chain comprises one of an air component separation facility, an oil field electric pump network, a refinery, and a metal ore production facility.

41. (Previously Presented) The computer readable storage medium of claim 28, wherein the production supply chain comprises one of an air component separation facility, an oil field electric pump network, a refinery, and a metal ore production facility.

42. (Previously Presented) The computing device of claim 35, wherein the production supply chain comprises one of an air component separation facility, an oil field electric pump network, a refinery, and a metal ore production facility.

## EVIDENCE APPENDIX

None.

# RELATED PROCEEDINGS APPENDIX

None.